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EDITORIAL DEPARTMENT NOTE

Efficiency and low cost are just as important in the office as in the factory. As we approach the transition and postwar periods and turn to the task of improving or re-establishing our cost control techniques, the opportunities for improvements in office operations should not be overlooked. Probably the office has suffered more than the plant as a result of manpower shortages and the added loads imposed by wartime conditions, and therefore offers the possibility for considerable improvement for the effort expended. Standards for office operations have not been in general use in the past, yet any accountant who has had experience with factory standards can appreciate the benefits to be gained from properly conceived and developed office production standards. The article in this issue of the *Bulletin* points the way to the development and use of such standards.

Harold C. Pennicke, the author of this article has had extensive experience in the field of office management. As Senior Associate of the late William H. Leffingwell, he served for three years as Vice President of W. H. Leffingwell, Inc., Consulting Management Engineers, and later carried on for eight years a consulting practice as Management Counsel under his own name. In addition to his consulting practice, Mr. Pennicke has served for more than fifteen years as an executive in the insurance business and is now Comptroller of three Massachusetts Protective Companies in Worcester, Mass. For many years, Mr. Pennicke has been active in several management societies and has contributed extensively to the literature of management. He served for three years as National Secretary of the National Office Management Association. Mr. Pennicke's article was presented as an address before the Binghamton Chapter of N.A.C.A last April.

Articles published in the *Bulletin* present many different viewpoints. In publishing them the Asociation is not sponsoring the view expressed, but is endeavoring to provide for its members material which will be helpful and stimulating. Constructive comments are welcomed and will be published in the Forum Section of the *Bulletin*.

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OCTOBER 15, 1944

HOW TO SET OFFICE PRODUCTION STANDARDS

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PRODUCTION standards have long been used in industrial production and all industrial accountants are familiar with, or at least have a general knowledge of, the methods used by industry for the setting of such standards. During the war and particularly within the last year, there has been a more general recognition of the importance of the use of wage incentives to stimulate industrial production. Production standards are, as we know, a prerequisite to the use of any kind of a wage incentive plan and therefore have received considerable publicity and a more general acceptance by both management and labor.

Reasons for Lack of General Acceptance of Office Standards

Production standards have not, however, been so generally accepted for office work. From my experience I should say that there are several good reasons for this unusual situation.

First, it is only natural that management should place the emphasis on industrial production standards since the need is more obvious and the results of such standards are more readily interpreted in cost and profit figures.

Second, it is much easier to develop time-study men for industrial work than for office work. Machine speeds and capacities are either known or are readily obtainable, and industrial production deals with a visible product, on which all the operations contributing to the finished article can be definitely segregated, observed, and studied. Clerical production, on the other hand, is an intangible product more difficult to segregate in its various steps of production and, therefore, much more difficult to observe and study.

Third, pressures of production problems upon top management leave little time available for busy executives to give intelligent consideration to office problems of management. For

example, it has been in only comparatively recent years that top management has recognized the increasing importance of its office and clerical staffs and realized that this important adjunct to business presents the same opportunities for reduced costs and therefore increased profits as exists in the production end of the business. The war has stimulated this view, and it is my opinion that a much greater use of office production standards will be made during the reconversion and readjustment periods which will follow the peace.

Development of Office Standards Under Present Conditions

The setting of office production standards is a highly technical, as well as a somewhat tedious and time-consuming, operation. The office executive, if his office is a large one, will seldom, if ever, be able to give enough of his personal time to do this work himself. He will need, and should have, the assistance of a competent planning and time-study staff. Such staffs have already been greatly depleted by transfer to the armed services or to government work. If he has not previously had such staff assistance, he faces a difficult and probably impossible task to find experienced personnel in these war times. It requires from six months to several years to train a capable methods and time-study man for office work. For these reasons, it seemed to me that the emphasis today should be placed upon re-examining our standard techniques, seeing what can be done to simplify them, and expanding their application under wartime conditions without affecting the validity, and therefore the usefulness, of the resulting standards.

Let me emphasize that under ordinary conditions, when circumstances permit and the nature of the work requires it, the standard time-study methods should be used as they are more accurate than any substitute method. We all know, however, that in machine shop practice certain tolerances are allowable, and these vary greatly according to the purpose for which the finished product is to be used. Similar tolerances are just as useful in office work when intelligently applied. There is no such thing as absolute perfection, certainly not when its attainment rests to such a large extent upon the human element. For certain office operations a standard as near perfection as possible is required, i.e., where

financial records are involved or when errors would involve a financial loss to the company or when wage and salary rates are to be set. In many other cases, as for example, in analyzing a routine, developing a new method, or increasing production, the degree of perfection which should be attained can well be balanced against, or determined by, the cost involved.

I have seen many examples in my own experience where to get the last 5 or 10 per cent possible out of a method or routine study would cost twice as much as if a practical and entirely satisfactory result of 90 to 95 per cent perfection were obtained. This is especially true because it is necessary, during a trial period of the new method, to make minor adjustments regardless of how carefully the new method had been planned, and when making these adjustments much of the remaining possibilities can be realized. Under such circumstances, twice as many problems can be covered for the same amount of time and money invested with little, if any, sacrifice in the end result. By the same reasoning, if production standards are to be used for wage incentive purposes, the results should be as nearly perfect as possible. If they are not, then a reasonable and practical result may be obtained by using a statistical, in preference to a time-study, approach to the problem.

Uses of Production Standard

A production standard is not a means of measuring production. Rather, it is a standard against which the measured production of one person, or a group of persons, can be compared for the purpose of determining the degree or percentage of satisfactory performance attained. It serves as a valuable and essential management tool for:

1. Assessing the value of the individual worker,
2. Making equitable wage adjustments,
3. Controlling individual or group production,
4. Intelligently planning the work,
5. Determining the staff required to handle any given volume of work,
6. Determining the time required to complete any given volume of work,

7. Making staff adjustments to follow the flow to obtain maximum production, and
8. Gauging the progress of the training.

It will also accomplish the following:

1. Simplify budgeting of clerical costs,
2. Increase production and decrease unit costs,
3. Provide the basis for wage incentive plans,
4. Make possible a comparison of standard against actual costs, and
5. Measure the efficiency of office operations.

It is true that a few of the above may be accomplished by the use of measured production alone, but certainly not to the extent that is possible when production standards are used.

Jobs on Which Standards Should Be Set

Production standards can be set on any office job where a unit of production can be established to measure the work done. There can be found a unit of measurement for practically any kind of office work. It may be necessary, and it is occasionally advisable, to select a unit of work which applies to a group of workers whose combined efforts produce a finished piece of clerical production. This method can always be used if no unit can be found to measure the production of a single operation. Expense of measuring the work may also present a problem, since it frequently happens that one person may perform a variety of different operations during the course of a single day's work. Under such circumstances it is necessary to divide the job as to standardized and non-standardized operations and set production standards only for the former. The non-standardized operations, those which it is determined are not sufficiently important for the setting of production standards, can then be handled by recording the time devoted to them and subtracting this time from the total time worked. The remainder will be the time consumed upon operations for which standards of production can be set.

Those jobs containing a high percentage of repetitive operations will usually warrant the greater investment in time and effort expended in the setting of the standards. Conversely, it may prove uneconomical to set production standards for jobs

which contain no repetitive operations, or where repetitive operations occur at long interspersed intervals. There are, of course, important exceptions to any such rule of procedure, and decisions should be made after an examination of the facts surrounding any particular job.

Only a careful analysis of a particular job, including its relationship to other work in the department, can enable one to determine whether or not a production standard should be set for the work, the amount of time which should be devoted to the setting of the standard, whether the standard should be set on an individual or a group production basis, and finally, which techniques or combinations of them should be used in setting the standard. This can be acquired only from accumulated experience obtained by the setting of such standards for a variety of clerical jobs. Once a standard has been established it should not be changed unless the entire job has changed, in which event a new standard can be set on the new work.

Routine and Method Studies Required

If the job for which standards are to be set is one of several involved in a major routine, then it is desirable to first make an analysis of the entire routine. Few major routines begin and end within the confines of a single department. Changes can seldom be made in any one job in a routine without affecting the work of other jobs in that routine, and frequently the changes also affect other departments. Almost invariably the routine analysis results in a general simplification of the entire routine and may radically change the particular work for which the standard is to be set.

Let me add the following pertinent observations: Information necessary for routine analysis can be obtained only in sufficient and accurate detail by personal observation of each step and each operation in the routine—

a. By recording the information during the interview,
b. By tracing from source to destination all papers used in the routine and through each individual step and operation of their flow,
c. By observing and making notes of all obstacles encountered by the clerks which interfere with the speed and rhythm of the operation, and

d. By observing and noting any improvements which can be made in the equipment used or in the design or arrangement of the work place.

I have found it more convenient to record the information obtained in these last two observations separate from that which covers the physical tracing of the routine itself. These last two items really pertain to methods study and are obtained during the routine study merely as a matter of convenience to save disturbing the clerk twice when once will suffice.

Requirements for Routine and Method Analyst

It is possible to teach any intelligent person how to gather routine analysis information and how to make observational method studies in from six months to a year. This assumes that the person has a satisfactory personality and can handle his personal contacts in such a manner that he can gain the cooperation of those members of the clerical staff whom he must interview during the course of his work. Actual management experience is, however, a major requirement for the analysis of the information collected. The broader this experience has been, the more complete and accurate will be the analysis. Lack of sufficient experience will result in only the more obvious wrongs being recognized, and many hidden and far more important conclusions will be overlooked. Although any analysis is often better than none, if time and money are to be invested in this work the results should be the very best obtainable consistent with the purpose of the study.

Job Analysis Always Required

Job analysis techniques were among the earliest tools used in studying the office. While many different forms have also been developed I prefer one which gives the employee an opportunity to estimate and express the percentage of time which he gives to the several duties which make up his job. Even if such estimates may not be wholly accurate, they serve as an important index as to the distribution of time among the several duties which are usually classified as those performed daily and those which are performed periodically at other than regular daily intervals. Such a statement of duties enables the person studying a job for the purpose of setting production standards to know which, if any,

miscellaneous operations can be either transferred to another job and which, if retained, must be considered as non-standard and kept upon purely a time consumed rather than a production standard basis. It is assumed that any methods study required is made as an integral part of the routine analysis procedure as previously described, but if it has been omitted for any reason, then a methods study of the job must be made separately.

Setting the Production Standard

These important preliminaries, i.e., the routine analysis and method studies of the job or jobs for which we wish to set production standards, having been completed, our next task is to simplify all operations where such simplification is possible and to teach the worker any new or revised methods which have been adopted. We are then ready to set the production standard.

From years of doing this work I have accumulated a number of elemental times which can be used as check standards for these respective elements wherever they may occur in office work. It should be realized, however, that few, if any, office jobs are ever made up solely of such so-called standard elements. A job may contain one or more standard elements combined with certain other elements which are indigenous to that particular job and to no other job in that or any other office. It is the sum-total of all elemental times (both standard and indigenous) which determines the production standard for a specific job. Accordingly, this resulting production standard can be used for the one specific purpose it was custom-made to fit and for no similar job in any other organization.

A production standard is affected not only by the sum of the elemental times, but each of these times is dependent upon the specific methods by which the work must be done and also by both the volume and the flow of work to the job. These last two factors are highly variable, even under like circumstances in the same lines of business. Flow can be established at the best level under the prevailing circumstances, but even this varies widely in different offices. Volume, for the majority of office operations, is an uncontrollable factor subject to seasonal fluctuations and to the effect of changing economic conditions. Volume of work in the office depends primarily upon the current demand for a company's

product as it is reflected in the form of orders received. The few exceptions which may be taken to this rather specific statement are not pertinent to our subject.

Techniques for Setting Standards

Several forms of analysis are available, but the two most commonly used are time study and micro-motion study. Some confusion has resulted from the custom which has developed of using the phrase "time and motion study," as though the two were one and the same thing; actually they are quite different, although they are closely related to each other. You will note that I have already discussed the subject of motion study as a prerequisite to the setting of the standard. Only in "micro-motion study," which uses the motion picture camera in combination with a clock, are both time and motion studies combined.

Nature of Time Study

It was Frederick W. Taylor, the great pioneer in the field of scientific industrial management who, in discussing an A.S.M.E. report on "The Present State of the Art of Industrial Management" in 1912, said:[1]

> "Time study is the one element in scientific management beyond all others making possible the "transfer of skill from management to men." The nature of time study, however, is but imperfectly understood, and it is therefore important to define it clearly. "Time study" consists of two broad divisions; first, analytical work and second, constructive work. The analytical work of time study is as follows:
>
> a. Divide the work of a man performing any job into simple elementary movements.
> b. Pick out all useless movements and discard them.
> c. Study, one after another, just how each of several skilled workmen makes each elementary movement, and with the aid of a stop watch select the quickest and best method of making each elementary movement known in the trade.
> d. Describe, record, and index each elementary movement, with its proper time, so that it can be quickly found.

[1] Stenographic transcript from the private files of the late William Henry Leffingwell.

e. Study and record the percentage which must be added to the actual working time of a good workman to cover unavoidable delays, interruptions, and minor accidents, etc.

f. Study and record the percentage which must be added to cover the newness of a good workman to a job, the first few times that he does it. (This percentage is quite large on jobs made up of a large number of different elements composing a long sequence infrequently repeated. This factor grows smaller, however, as the work consists of a smaller number of different elements in a sequence that is more frequently repeated.)

g. Study and record the percentage of time that must be allowed for rest, and the intervals at which the rest must be taken, in order to offset physical fatigue.

"The constructive work of time study is as follows:

a. Add together into various groups such combinations of elementary movements as are frequently used in the same sequence in the trade, and record and index these groups so that they can be readily found.

b. From these several records, it is comparatively easy to select the proper series of motions which should be used by a workman in making any particular article, and by summing the times of these movements, and adding proper percentage allowances, to find the proper time for doing almost any class of work.

c. The analysis of a piece of work into its element almost always reveals the fact that many of the conditions surrounding and accompanying the work are defective; for instance, that improper tools are used, that the machines used in connection with it need perfecting, that the sanitary conditions are bad, etc. And knowledge so obtained leads frequently to constructive work of a high order, to the standardization of tools and conditions, and to the invention of superior methods and machines.

"It is unusual to make a study such as this of the elementary movements of the workmen in a trade. The instances in which this has been done are still rare. Most of the men who have made what they call "time study" have been contented with get-

ting the gross time of a whole cycle of operations necessary to do a particular piece of work, and at best they have thrown out the time when the workman was idle, or evidently purposely going slow."

How to Make the Time Study

As has been so aptly stated by Taylor, the special purpose of time study is to analyze the elements of an operation and not to obtain the over-all time of the entire operation. The latter is produced when these elemental times are later combined.

We are now ready to set our production standard by time study—using a stop watch as a means of recording the elemental times of the various operations which make up the contents of the job. In making any time studies for the purpose of setting standards, it is necessary that a sufficient number of operations be covered. This is usually left to the discretion of the person making the study although we have the general rule that "the longer the operation, the fewer the number of studies required and vice versa." The following interpretation of this rule may prove helpful:

Length of time of operation	*Number of studies to be made*
5 minutes and over	10
2-5 minutes	15
1-2 minutes	30
½ minute or less	45–60

It is safer to make more studies than may be necessary rather than to make too few. This schedule is for the use of trained time-study men. Those with less experience should increase the number of studies given.

During the process of recording the times consumed by several elements of the operation, the observer has to work very rapidly and synchronize his own motions. He must observe the beginning and ending of each element's cycle, read his stop watch accurately, and record both the description of the element and his reading of the watch. The watch is not stopped at the end of each cycle but is allowed to record the time continuously. Only continuous time is entered on the time study sheet. The exact time is obtained by subtraction and is entered on the sheet after the study has been

completed. A group of twenty-seven standard symbols can be used to simplify and expedite the recording. These symbols are as follows:

A	Assort	F	File	S	Stamp
Ar	Arrange	Fg	Figure	Sa	Set aside
At	Attach	Ft	Finger through	Sp	Separate
C	Checking	G	Get work	St	Staple
Ca	Carbons	L	List	T	Type
Cm	Clear machine	M	Match	Tp	Turn pages
Co	Calling off	P	Pick up	V	Investigate
Cp	Compare	Pp	Pick up and plan	W	Write
Ct	Count	R	Review	X	Out

Although any symbols may be originated, it greatly expedites the work of recording the time studies if this list of standard symbols is memorized and used. It covers the majority of repetitive operations to be found in office work. Special symbols for particular operations are originated as needed during the course of the time study.

Practically all office work consists of at least six standard elements. These are:

1. Preparation to do the job.
2. Sorting and arranging the work to be done.
3. Searching for and finding information.
4. Performing the work; this may consist of a series of elements all indigenous to the particular operation being performed—the actual accomplishment of the task being studied.
5. Removing the work after finishing the operation cycle and returning to position for the next cycle.
6. Adjustment—for the next cycle.

Many of these elements will repeat themselves during the operation cycle and, of course, they may not occur in the order given.

If any choice is available as to the person to be studied, i.e., if a group of persons are performing the same cycle of operations, the person chosen should be the best operator in the group. The purpose of the time study should be fully explained, especially that the watch is used, not to see how fast the operator is doing

the job, but to discover the elemental times so that a standard for production can be set on that particular work. The full cooperation of the subject being studied is essential to the successful setting of the standard.

The timing of the operation is now started and proceeds until the required number of studies has been made. The time studies do not necessarily have to be made at one continuous sitting. In fact, it is often better to spread the time studies out over several consecutive days and to choose different hours in the day for the respective studies. This will relieve the tension of the subject and give a spread to any fatigue factor involved—an important point inasmuch as no special adjustment for fatigue is made in compiling the final results of the study. The fatigue factor is included in an adjustment made by formula, for unavoidable delay.

The results of the several time studies are now summarized and the elemental times compiled. The resulting figures for each element of the operation, when added together, constitute the overall operation time for the job. After adjusting this figure for unavoidable delay according to formulae which are available for that purpose[2], the resulting figure will be the standard time required to do the particular job studied. From this we can compute the production standard for an hourly, daily, or weekly basis.

I have endeavored to keep this explanation as simple as possible so as not to confuse the continuity of the procedure. There is, however, one further point which has to be considered when compiling the results of the time study. In office work, it will frequently be found that the work unit for the job being timed is not uniform. For example, on an order operation the contents of the single order may vary widely either as to the number of items or the amount of typing involved, or both. If these averaged out over a day's work it would not affect the validity of the standard. In many cases, however, it will be found that the average figures will vary greatly from day to day. Under such circumstances, supporting statistical studies of the contents of the work unit are made, and from analysis of this data the production standard is expressed as an equivalent of a work unit containing an average number of items and not in the terms of the work unit itself. For example, the standard might be based upon an

[2] Leffingwell's *Office Management, Principles and Practice*, p. 784.

order which contained an average number of items and not upon the number of orders handled. This is a mathematical adjustment which is made during the process of summarizing the time study data and in no way changes the procedure followed in making the time study on any particular job.

Micro-Motion Time Study

Although micro-motion time studies have been widely used in industrial work they have not, as yet, been so generally used on office operations. Except for the special equipment used for lighting, photographing, and timing the operation, such studies follow the same general procedure as has been described when a stop watch is used. The same summarizing of the information has to be completed, and the production standard is determined by the same process. My own experience has been that it does not shorten the over-all time required to set clerical production standards. It does, however, combine time and motion study on the same film. It requires a much larger investment in equipment and special training of the time-study analyst in the art of photography. It is especially valuable for training purposes, because it provides a convenient means of teaching the time-study and motion-study techniques. It preserves both the former method and the new method for future visual comparisons and has considerable value in teaching clerks the newly standardized methods. Its popularity for office use will undoubtedly increase, but I do not believe it will soon supplant the stop watch method.

The Statistical Method

Earlier in this paper I suggested that, under present wartime conditions, it would be well to re-examine the two standard techniques to see if they could not be modified or if any other technique might be used which would be sufficiently accurate and practicable for the setting of office production standards but which would require less time and cause less interruption to the handling of the daily work. Under certain conditions the statistical method can be applied to this problem with entirely satisfactory results. It has several outstanding advantages which make it a thoroughly practical method. The use of production statistics when available (and they are usually either available or obtainable

from company records in the larger offices) permits the setting of a production standard without the use of either the time study or micro-time study techniques. The production standard can be set without disturbing either the worker or the department, provided, of course, the job analysis, motion study, and routine analysis studies have previously been made and that the new method of doing the work (if any) is in use. In other words, the use of production statistics replaces the use of the stop watch or micro-filming insofar as these devices were used for setting office production standards on current operations. This method is most accurate when used for the setting of group production standards, although it can also be satisfactorily used for setting individual job standards. It can be applied to departments operating under unusual volume pressure without disturbance of current work and this at the time when the other methods can seldom be used advantageously. Standards obtained under such unusual work pressure conditions will reflect the highest degree of accuracy. They can be tested by comparing them with actual work results, and these should reflect the maximum production possibilities of the department.

The Clerical Minute Ratio

More than twenty years ago the late William H. Leffingwell developed what is known as the clerical minutes per order (C.M.O.) ratio method for measuring clerical efficiency. It has been used for this purpose by many different industries since that time. It was originally intended only as an over-all measuring device, that is, it was applied to all clerical workers within an organization, who had anything to do with the handling of an order, regardless of the department with which they might be affiliated. By applying the ratio in this manner it was possible, as demonstrated by a survey made some years ago by *System Magazine* (now *American Business*), to get comparative figures on a national scale, regardless of the character of the business. During the past eight years, however, I have used this same basic method as the means of setting production standards for an individual job, a group operation, or for the production of an entire department.

The ratio obtained by taking the number of clerical minutes per

week actually worked on any selected unit of clerical production (rather than for the company as a whole) and dividing this figure by the number of such standard work units as were produced over that particular week period, provides a convenient efficiency ratio between the volume of work done and clerical time expended. When this ratio is applied to available production figures covering a span of one or more years it can, by a process of analysis, result in the setting of a production standard for that particular work unit. The method is perhaps best illustrated by giving a case example.

Application of the Statistical Method

An order department of a large manufacturing plant had been keeping records over a period of several years. These records gave, on a week-to-week basis, the number of orders received, the number of orders handled, the number of orders held over at the end of the week, and the number of people and total clerical minutes worked for each of these weekly periods. These figures were charted for a two-year period. By dividing the number of orders handled each week by the total clerical time for that week used in the handling of the orders, the clerical minutes per order ratio was obtained for each week in this two-year period, and this was likewise charted. A careful analysis of the charts and of the supporting figures clearly indicated that the highest efficiency was attained during a six-week period in the more recent of these two years when both the incoming volume and the back-log of orders reached extraordinarily high peaks and during which same period the personnel of the order department (and therefore the clerical time expended) was at its lowest figure. During this period the C.M.O. ratio ranged from 17.5 to 21.4, but from a record of the department's activity during this particular period it was evident that a sustained production at even the 21.4 figure could not be expected. Further analysis indicated that the C.M.O. ratio could be set at 25.0 and this became the production standard for the department.

By using this same statistical analysis, it is possible to calculate the staff required to take care of any required variation in volume of work. The following schedule shows the estimated staff re-

quired to handle a fluctuating volume ranging from 400 to 250 orders a day.

Table of Personnel and Production Standards

(Based on no absences and 40 hours per week)

Staff	Clerical Minutes per Week	Weekly Maximum Production	Average Per Day
21	50,400	2010	402
20	48,000	1920	384
19	45,600	1825	365
18	43,200	1725	345
17	40,800	1630	326
16	38,400	1535	307
15	36,000	1440	288
14	33,600	1345	269
13	31,200	1255	251

This table indicates that the order department could have handled up to the maximum number of orders received during the last eight months of the year with three fewer clerks than were on the staff. However, no provision was made in the figures for absences due to sickness and for any unexpected increase in the number of orders received. Although the table shows that, without any reductions for absence a staff of 16 clerks should provide a sustained production volume of 1535 orders per week, it was recommended that the permanent staff of the department be set at 18 clerks, or one less than the current staff. This would not only take care of any sudden increase in volume which the analysis showed frequently occurred, but would provide for any absences from the staff. To make this adjustment would increase the C.M.O. ratio from 25.0 to 28.1 and represent a loss in operating efficiency of 12 per cent from the 25.0 standard. In this instance, this drop in efficiency was deliberately taken and was interpreted as a reserve capacity which would carry 195 orders per week over and above the 1535 orders which was the estimated maximum expected volume to be handled.

The production standard was, however, set at 25.0 (the original figure indicated by the study) with the understanding that any

attained ratio between this figure and 28.1 would be considered satisfactory performance.

As an inducement for the staff to attain the standard of production, a blackboard was placed in the department and on this board was recorded each hour of the work day, the number of orders handled and the resulting C.M.O. ratio. The following exhibit shows the actual work record of the department made on the first day when the new standard was in use.

Daily Work Record

Hours	Orders	C.M.O.
8- 9	25	41
9-10	28	36.4
10-11	31	33
11-12	50	20.4
1- 2	42	24.3
2- 3	45	22.7
3- 4	50	20.4
4- 5	62	16.5
	333	24.5

It can be seen from this actual work record that the department exceeded the 25.0 production standard attaining a ratio of 24.5 for the day's work.

This statistical method of setting production standards on a group or departmental basis permits full compensation to be made for a widely fluctuating volume of work without requiring any change to be made in the production standard. It is, of course, entirely possible to attain the production standard for any reasonable fluctuation and volume. To do so, however, would require either a temporary transfer of help or a permanent staff reduction to be made in the low-valley periods. Whether or not the production standard should be maintained during low-valley periods is, of course, a matter for management to decide under conditions existing in the particular office.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUGUST 24, 1912, AND MARCH 3, 1933

Of N. A. C. A. Bulletin, published semi-monthly at New York, N. Y., for Oct. 1, 1944, State of New York, County of New York ss.

Before me a Notary Public in and for the State and county aforesaid, personally appeared R. P. Marple, who having been duly sworn according to law, deposes and says that he is the Editor of the N. A. C. A. Bulletin and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, National Association of Cost Accountants, 385 Madison Ave., New York 17, N. Y. Editor, R. P. Marple, 385 Madison Ave., New York 17, N. Y. Managing Editor, none. Business Manager, Wyman P. Fiske, 385 Madison Ave., New York 17, N. Y.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.) National Association of Cost Accountants, 385 Madison Ave., New York 17, N. Y. President, Martin A. Moore, Hyatt Bearings Div., General Motors Corp., Harrison, N. J. Secretary, Wyman P. Fiske, 385 Madison Ave., New York 17, N. Y. Treasurer, Philip J. Warner, The Ronald Press Co., 15 E. 26th St., New York 10, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is.....(This information is required from daily publications only.)

R. P. MARPLE,
Editor.

Sworn to and subscribed before me this 22nd day of September, 1944.
(Seal)

IRVING I. STEINHOLTZ,
Notary Public, New York County.
N. Y. Co. Clk's No. 512, Reg. No. 939-S-6.
Term Expires March 30, 1946.